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October 5, 1957

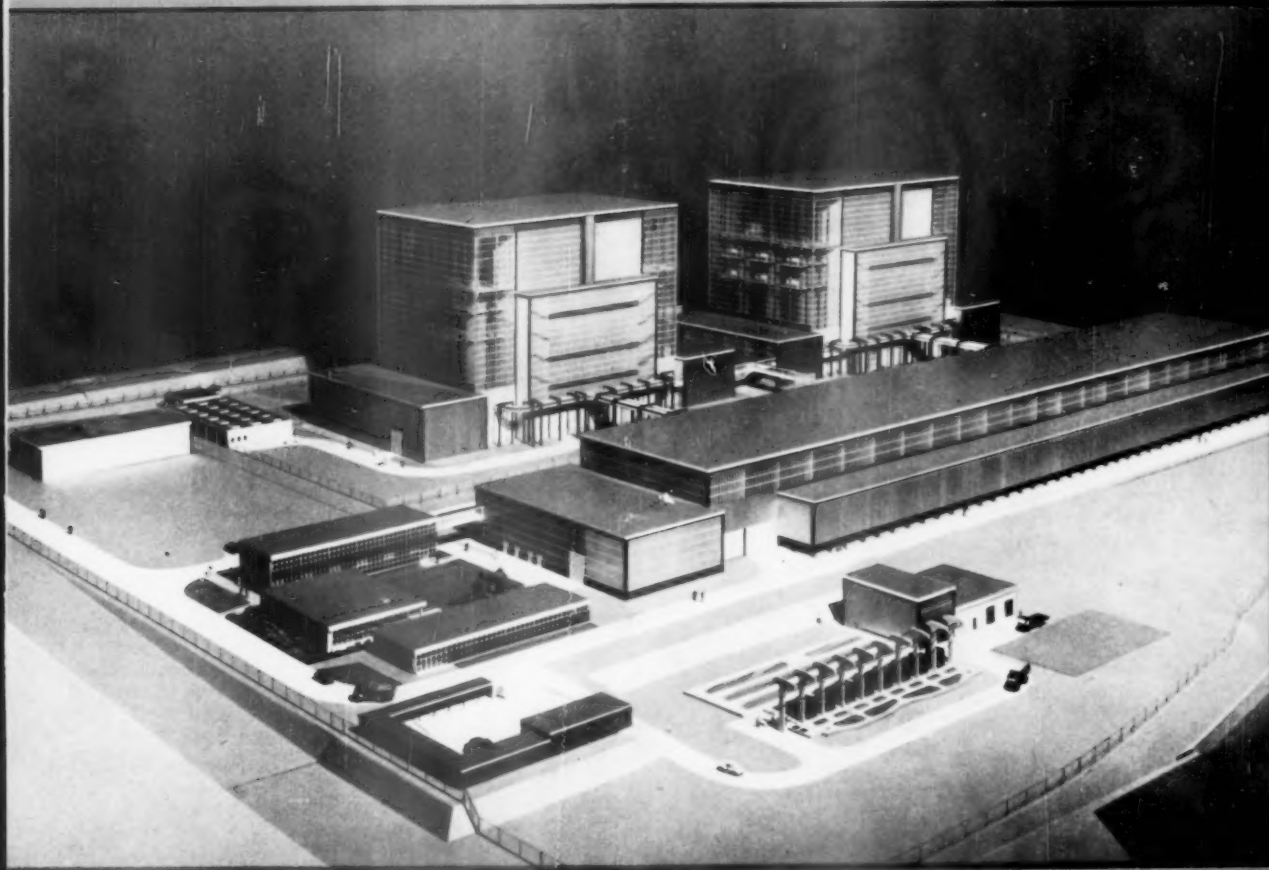
VOL. 72, NO. 14 PAGES 209-224

SCIENCE NEWS LETTER



®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



British Atomic Power

See Page 213

A SCIENCE SERVICE PUBLICATION

Kodak reports on:

cellulose acetate phthalate in the tummy... photographic materials for looking up

17 years have gone by

The great Ivan Pavlov—he of the salivating dogs that you learned about in Psychology I—did more than found behaviorism. By shedding illumination into the dark workings of the alimentary canal, the old boy lit the light that set off a chain of more than 100 patents on preparations that would get medicines safely through the stomach and on into the intestine. Each shines forth, lives out its allotted legal span of 17 years with more or less success, expires, and becomes part of the art that anyone skilled in the art of pharmacy may freely practice.

This year expiration befell U. S. 2,196,768, one of the more successful of them. It belonged to us, of all people.

In the dull monotone affected by the patent bar, this document drones on and on about “a medicament surrounded by an enteric film or layer of a cellulose derivative which contains a dicarboxylic acid radicle [*sic*] and which contains free carboxyl groups . . .” etc., etc., etc. In Examples VII and VIII and Claim 10 appears cellulose acetate-phthalate. That was it. That is our baby.

Reports in the pharmaceutical journals over the years on experiments to compare the properties of available enteric coating materials usually wind up reading like testimonials for CAP. Well over a billion doses of medicine coated with CAP have been swallowed. That may not be so many for 17 years, but it isn't bad either.

The reason CAP has been able to do mankind a little good is that it's just extremely resistant to gastric action, most susceptible to the hydrolytic influence of intestinal esterases, and quite independent of the assumption that the contents of the human upper intestine are reliably alkaline. Also, of the controversial assumption that the stomach empties at a reliable rate. Tablets coated with CAP have shown no signs of disintegration after seven days in a continuously agitated artificial gastric juice. In the

same investigation in simulated intestinal juice at pH 6.9, rupture took place in 70 to 75 minutes, while at pH 8.5 all tablets disintegrated within 50 minutes.

The bill for the cellulose ester research that led to CAP has been paid. Now if you want to make an enteric-coated medicament with it, your lawyers can forget about our lawyers. All we can do is hope you will buy Eastman Cellulose Acetate Phthalate, wherein about half of the original glucose hydroxyl groups are acetylated and about a quarter are phthalylated with one of the two carboxyls of phthalic acid. It is sold by Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company) and looks like this:



A hobby for clear nights

The following proposal offers little prospect for fame, advancement, or even succor to suffering humanity. All it offers is a chance to add a few grains to the mortar in the edifice of science. Here and there are a few happy people who enjoy that sort of thing.

Why not celebrate the International Geophysical Year by gathering some data for the IGY Auroral Data Center, Rockefeller Hall, Cornell University, Ithaca, N. Y. (or, if you are Canadian, for the IGY Auroral Centre, National Research Council, Ottawa)? Write them for instructions.

The sun is now at the stormy stage of its cycle. It sends forth bursts of electrons and ions which set the night sky ablaze with the rayed arcs, homogeneous arcs, pulsating arcs, pulsating spots, glows, rays, coronas, and flames of the aurora. On clear, moonless nights when the show is on, in places without overwhelming competition from smog-scattered illumination emitted by certain atmospheric gases when they are excited in glass tubes for the greater glory of hot dogs and

horsepower, it is worth looking up in the sky for.

Looking is all you need do. Either the Center or the Centre supplies free report forms carrying a printed protractor for measuring angles in the sky.

Photographic records, however, are also wanted. To make them one needs a camera lens faster than $f/4.5$. (The Cine-Kodak K-100 Cameras of the U. S. and Canadian official observing programs have $f/1.4$ lenses.) With Kodak Royal Pan Film or Kodak Tri-X Film at $f/3.5$, reasonable exposure times for medium to bright auroras run from 18 to 60 seconds. Much faster and better for the purpose is the phenomenal new Kodak Royal-X Pan Film, but it must be processed according to the packaged instructions rather than through usual commercial channels.

All auroral photographs should be labeled with the observer's location, the double date (e.g. October 17-18), the exact time and time zone, the azimuth and elevation of the center of the photograph as close as you can (ideally by identifying any bright stars in your picture), and the usual photographic data. Aim along the meridian and start on the first minute of each five, first the southernmost part of the display because that is the most interesting scientifically, then the northernmost part, then anything else on the meridian, then prominent forms in the east, and finally toward the end of the five-minute interval, prominent forms in the west. That way there is hope for simultaneous coverage from widely spaced points. South of 40° N. in the eastern U. S. and south of 45° in the west, any aurora is worth photographing immediately, schedule or no schedule. A red one is worth photographing at once, anywhere.

At Cornell, if necessary, they'll put the graduate students' wives to work reading the flood of photos and reports that ought to come in.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

Kodak
TRADE MARK

ORNITHOLOGY

Whooping Cranes Return

The annual migration of whooping cranes, the rarest birds in North America, has begun with some 20 to 30 birds making the southward journey to their winter home in Texas.

► RAISE your gun and shoot at a big white bird flying south this fall and you may help write "the end" to a 39-year-old struggle to preserve the whooping crane—the rarest bird in North America.

If you sight a long-necked and long-legged white bird, with jet black wing tips, flying with a quick upward "flick" to its wings, do not shoot it.

If you see a five-foot tall bird, white with a red crown and black markings across each cheek, standing or feeding in a marsh, do not shoot it. The bird is probably a whooping crane.

Its flyway is south from Canada, across the Dakotas, Nebraska, Kansas, Oklahoma and central Texas to the Aransas National Wildlife Refuge on Texas' Gulf Coast.

Wildlife conservation officials in Washington warn that the most dangerous time of the year for the whoopers is the three-month period September through November. It is on their 2,400-mile flight along the flyway to winter homes that the birds attract the attention of hunters and face the added danger of the gun. By the end of November usually the last few stragglers are back from their summer nesting grounds.

If hunters are careful, and non-human predators have not taken their toll of young birds, between 20 and 30 rare whooping cranes are expected to arrive at the Aransas wildlife sanctuary this year.

This will bring the total number of birds to its highest point since 1949-50 when there were 34. Five of the birds, three adults and two famous chicks, make their homes in zoos.

For more than half the year, the birds are protected by their remoteness from civilization both in Canada and the United States. From December through April, the cranes winter on the tidal flats portion of the 47,000-acre Aransas refuge. There a crane family can bask in the privacy of a 400-acre homesite.

During their breeding season in the summer, the cranes nest "somewhere" in the vast 17,000 square miles of Wood Buffalo Park in the northwestern Canadian wilderness. The location of the whooping cranes' breeding grounds was discovered in 1955, but ornithologists nevertheless do not locate all the birds that arrive north each year.

Since 1938, it has been a Federal offense to shoot or "otherwise molest" the bird.

At one time, before 1860, the whooping crane ranged from the Arctic coast to central Mexico and from Utah to New Jersey and South Carolina. Instead of seeing possibly as many as 1,000 whooping cranes winging their way south during a fall season, as the pioneer Americans did, a careful observer today may spot some of the two dozen-odd

birds that it is hoped will be returning this fall.

Whooping cranes never travel in large flocks, but usually fly singly, in pairs or in families.

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OCEANOGRAPHY

Northwest Passage Aids In Supplying DEW Line

► THE NORTHWEST PASSAGE found this summer by three American ships and one Canadian ship will be a year-round supply line to the 3,000-mile-long DEW line spanning the top of the continent to warn of possible enemy attack.

Climax of their history-making journey came when the three U. S. cutters, the *Storis*, *Bramble* and *Spar*, first returned to U. S. ports, having proved seaborne support of the DEW (Distant Early Warning) line possible.

The Coast Guard ships were escorted through the most treacherous part of their journey, the short cut through Bellot Strait, by the Canadian icebreaker, *HMCS Labrador*. The deep-water route between the Pacific and Atlantic Oceans was traversed in a west-to-east direction.

With the exception of icebreakers, only

shallow draft vehicles, and few of these, had previously made the Northwest Passage.

Daring men have tried for as long as 450 years, but one of the few who made it was the Norwegian explorer, Roald Amundsen. He completed the passage by sea in a single ship. After wintering three years in the Arctic, he completed the east-to-west voyage in 1906 in the 47-ton, nine-foot draft ship, the *Gjoa*.

Bellot Strait is named for the French naval officer who discovered it in 1852. Its appearance is precisely that of a Greenland fiord. The Strait is about 20 miles long and one mile wide in the narrowest part. It separates Boothia Peninsula, the northernmost point of land of continental North America, and Somerset Island.

The practical Northwest Passage could be used as an escape route for ships of the Military Sea Transportation Service, or MSTs, caught in freezing ice after their cargo had been used to supply DEW line stations in the far North. Previously the ships were sent dashing in as soon as the water thawed, then rushed out after their cargo was discharged.

Exploration for a possible sea route between the Atlantic and Pacific was personally directed last year by Vice Adm. John M. Will, USN, commander of MSTs. He said "this year MSTs faces in some areas of the Arctic the worst ice year ever recorded."

The commander of the MSTs commented that the Service's greatest asset in overcoming the hazards of wind, ice and fog was the experience gained during eight years of polar logistics supplemented by two years' participation in Operation Deepfreeze in the Antarctic.

Science News Letter, October 5, 1957



SHORT-CUT NORTHWEST PASSAGE — The U. S. Coast Guard ships *Bramble* (WAGL-392), its bow showing in the foreground, *Storis* (W-38) and *Spar* (WAGL-403) pound through heavy ice in the Amundsen Gulf, Canadian Northwest Territory, eastward toward Dolphin and Union Straits.

BIOLOGY

Air Ions Kill Bacteria

▶ WHAT APPEARS to be the first scientifically substantiated success in killing bacteria with air ions, clumps of air molecules with an electrical charge, was reported at the First Congress of the International Society of Bioclimatology and Biometeorology meeting in Vienna, Austria.

There has been much talk about the possible use of air ions to provide germ-free air through air conditioning systems. However, a clear demonstration that air ions have germ-killing power has been lacking.

The biological experiments were performed under Dr. A. P. Krueger, University of California bacteriologist, and the engineering developments were achieved by W. Wesley Hicks and J. C. Beckett of the Wesix Electric Heater Company of San Francisco.

They reported air ions killed staphylococci bacteria under the special conditions of their experiments. Success resulted from the development of new microchemical techniques in which bacteria were suspended in minute droplets of distilled water.

The first experiments, in which bacteria were suspended in ordinary sized spray droplets of nutrient medium, failed.

The scientists later developed special techniques for making tiny droplets of only one

one-hundredth of a cubic centimeter. They also developed means of determining the number of bacteria in a sample and the number of ions hitting the droplet target, both important in scientific proof of the biological effect of ions.

The scientists said that in the larger droplets the bacteria apparently are protected, while in the smaller ones the agents rise to the surface often enough for the ions to have an effect.

The ions were generated in the exposure chamber by radioactive polonium-210 and tritium.

One billion ions per second could be made to hit a surface of one square centimeter compared to about 600 in each cubic centimeter of normal air.

About ten billion staphylococci were suspended in the exposure chamber at a time. Normally, there are about three million survivors after several hours. Air ions reduced the number of survivors as much as one one-thousandth of normal.

Dr. Krueger said it is premature to speculate on possible applications such as germ-free air through air conditioning, based on the new information.

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METEOROLOGY

Storm Shown In Three-D

▶ THREE-DIMENSIONAL pictures of the tornado- and rain-bearing thunderstorm systems known as squall lines were shown for the first time to scientists attending international geophysical meetings.

These systems are at most 250 miles across and last only six to eight hours. They are often too small to be detected by the network of Weather Bureau stations. Tetsuya Fujita of the University of Chicago told a joint meeting of the International Association of Meteorology and the International Union of Geodesy and Geophysics.

The drawings give a clear picture of the complex storm system, which near the ground resembles a miniature cold front.

The towering thunderstorm clouds are preceded by a shear of winds moving at right angles to them. This break in wind direction and temperature lessens with altitude and by 10,000 feet, the wind shear and cold front have disappeared. Still higher, the winds assume a writhing, snake-like path.

In vertical cross-section, the heart of the system is an atmospheric tube of violent downdrafts surrounded by gentle updrafts. Ahead of the thunderstorms are three layers of turbulent air, each a distinct cell with a center of dry air and a shell of moist air. Between each cell is an inversion, or layer, marking a sudden temperature increase. Air normally is colder with increases in altitude.

Mr. Fujita superimposed on each of his drawings illustrations of how the storm's

heart appeared on a ground radar screen for comparison with radar screen photographs of tornadoes. His aim in doing this is to arrive at new theories of how tornadoes are born.

To analyze the small storm systems, Mr. Fujita used the most complete mass of weather data then available for a small area, the 1947 Thunderstorm Project at Wilmington, Ohio. Measurements of temperature, relative humidity, winds and air pressure were made hourly to 40,000 feet by 10 stations spaced approximately seven miles apart.

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PUBLIC HEALTH

New Red Cross First Aid Book Changes Old Rules

▶ A NEW FIRST AID textbook, replacing the one that has been in use for the last 12 years, has been published by the American National Red Cross. (See p. 220.)

It contains the latest first aid methods, including those developed in the past few years, such as the "mouth to mouth" breathing for infant artificial respiration (See SNL, July 6, p. 5).

Some of the old first aid principles have been replaced by newer ones, found to be more beneficial.

A tourniquet, the new book says, should not be loosened once it is put in place. It

can be left on for up to two hours without causing further damage. Former advice was to release it every 15 minutes.

Danger from lockjaw, or tetanus, is now associated with all wounds, not just the puncture kind, and the wounds should receive medical attention and possible immunization against tetanus.

When first aid is given for frostbite, the present rule is to warm the affected part rapidly instead of slowly.

The first aid textbook contains many informative photographs, drawings and colored plates, which show the various organs and systems of the body, as well as the natural appearance of some poisonous snakes and plants.

Science News Letter, October 5, 1957

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PALEONTOLOGY

Find Man-Like Ape

► **DISCOVERY** of a very ancient jawbone of a giant ape in a mountain cave in Kwangsi Province, South China, throws new light on a form of life that lay between ape and man on the evolutionary scale.

A Chinese paleontologist, Dr. Pei Wen-Chung of the Laboratory of Vertebrate Paleontology, Academia Sinica, reports the find in the *American Anthropologist* (Oct.).

The huge jaw bone is between 400,000 and 600,000 years old, Dr. Pei reports. It belongs, he says, to the ancient form of life called variously *Gigantopithecus*, or giant ape, and *Gigantanthropus*, or giant man. The creature had been known previously only from a small collection of tremendous teeth originally found in a Chinese chemist's shop where they were sold as "dragon teeth" with supposed magical properties.

The newly found fossil bones were also thought to be dragon bones by the peasant who unearthed them while digging for mineral fertilizer.

But when he filled two baskets with the fossils and carried them to a purchasing station, he discovered that a new law forbids the sale of dragon bones. He was persuaded to send the bones to the government Cultural Bureau in Lüchow. There the jaw was identified as belonging to *Gigantanthropus*.

Other fossil bones were found with the jaw in the lower part of a six-foot hard deposit on the floor of a cave on a steep 270-

foot mountain cliff. There were bones of deer, boar, tapir, stegodon and rhinoceros, animals known to have lived in China in the Middle Pleistocene Age, some 400,000 to 600,000 years ago.

The jaw, Dr. Pei concludes, is definitely of an ape, not a man. It settles the old scientific controversy of whether to call it "giant ape" or "giant man."

Wear on the teeth show "the animal had a mixed diet of meat and vegetables, quite different from that of modern apes which live on fruit." The animal, he also judges, must have been an old female ape.

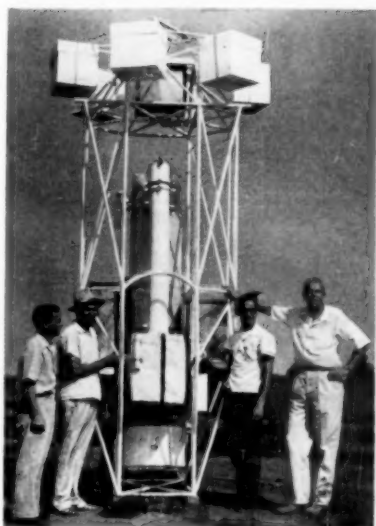
However, he reports, "this anthropoid was closer to man than any other ape yet discovered. It is estimated to have had a height of some 12 feet."

No objects that the giant ape could possibly have used as tools were found in the mountain cave. This, combined with the fact that animal bones found there were from either very old or very young animals, indicates the giant ape was a very poor hunter.

It probably died out, Dr. Pei indicates, because its low hunting ability was unable to provide food for its gigantic body.

The giant ape could not have been an ancestor of the much more developed Peking Man who lived about the same time in the less favorable environment of the north of China.

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PROJECT STRATOSCOPE—Shown here before launching the especially designed telescope and camera mechanism are some of the scientists associated with the project, including its director, Dr. Martin Schwarzschild, at the left.

ASTRONOMY

Take Photographs of Sun From 81,000 Feet Up

► **HISTORY-MAKING** photographs of the sun, the first to be taken above most of the earth's atmosphere, have been made.

The Office of Naval Research, which sponsors Project Stratoscope, launched the giant Skyhook balloon Wednesday, Sept. 25. Within an hour and one-half it rose to 81,000 feet above Minneapolis, Minn. The unmanned balloon carried a powerful, especially designed 12-inch telescope, a light-sensitive pointing mechanism, and a motion picture camera. (See SNL, Sept. 7, p. 147.)

The telescope was designed and built by Perkin-Elmer Corporation, Norwalk, Conn. It has a 12-inch aperture f.8 quartz mirror. The Newtonian secondary quartz mirror is mounted on a swinging arm so that it remained in the sun's image only long enough to obtain a photographic exposure.

The mirror rotates once per second, thus "cooling" about 98% of the time. The primary image was transferred from the secondary mirror to the film plane by a relay lens working at a magnification of 25, giving the system an effective focal length of 200 feet.

The relay lens was moved continuously, taking 20 positions every 20 seconds, to compensate for changes in the focal length caused by solar heating.

The parachute bearing the precision camera and high power telescope was recovered when it landed about eight miles west of Athens, Wisc.

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PUBLIC HEALTH

Save Drugs in Flu Flight

► **THE NATION'S** doctors have been advised to save antibiotics and sulfa drugs for patients with complications and not use them to treat Asian influenza.

The advice came from the American Medical Association in the form of a report by its Council on Drugs and in an accompanying editorial.

In the report, requested by the A.M.A.'s special committee on influenza, the Council points out that there is a similarity between this year's movement of the disease and that of 1918, which was frequently followed by pneumonia and its complications.

The report includes the following suggestions that "should guide the physician relative to the prophylaxis and treatment of secondary bacterial infection in patients suffering from influenza."

1. Since sulfonamides and antibiotics have no therapeutic effect on the viruses of influenza, their use in the primary treatment of influenza would be contrary to good medical practice.

2. These drugs should not be used in treating persons already suffering from the flu in the hope of preventing bacterial infection. The prime reason for this recommendation is to prevent the development of disease-producing strains of microorganisms that would be resistant to the drugs. And

secondly, to prevent the patient from becoming sensitive to drugs. The possible exceptions to this, the Council says, are pregnant women, debilitated infants and older individuals; patients who are being treated for bacterial infections who develop flu; and patients suffering from chronic, nonallergic respiratory tract disease.

3. All patients ill with influenza in whom it has been demonstrated that secondary bacterial infections have developed should be treated with a sulfa drug or antibiotic.

The A.M.A. editorial adds that actually very little can be done to treat influenza itself. The best treatment, which may help prevent complications, is bedrest, sufficient fluids and agents to reduce fever.

Science News Letter, October 5, 1957

TECHNOLOGY

British Atomic Power Center Planned

See Front Cover

► **GREAT BRITAIN** has announced that work has started on an atomic energy power station with an output of 500,000 kilowatts. A model of the station at Hinkley Point, Somerset, England, is shown on the cover of this week's **SCIENCE NEWS LETTER**.

CHEMISTRY

Chemical Aids Cook

The chemist brings his knowledge to the aid of the cook by adding glycerine to cooking water. The chemical cuts cooking time by as much as one-half.

► COOKING TIME can be greatly reduced by adding harmless glycerine to the water in which foods are cooked, scientists at the American Chemical Society meeting in New York learned.

A chemist, a research chemical engineer and a 14-year-old girl who plans a career in science reported the addition of glycerine to cooking water can cut food cooking time by as much as 50% without changing cooking techniques, altering nutritive value or digestibility of foods.

James Kanegis, chief of the chemical section of the U. S. Department of Commerce Office of Technical Services, Washington, his daughter Brenda, and Dr. Roger Gilmont, Manostat Corporation, New York, investigated the addition of glycerine in several methods of cooking, including hard boiling, scrambling and poaching of eggs, double boiling of cereal, pressure cooking of potatoes in steam and boiling of prunes in water.

In almost all cases, the investigators found cooking time could be cut in half by the addition of about 60% glycerine by weight to the water.

Mr. Kanegis told SCIENCE SERVICE the glycerine and water technique could replace fats and oils in the frying of many foods, as demonstrated in the experiments with scrambled eggs.

"Fats and oils are used in frying," he pointed out, "to enable the cook to achieve a higher temperature than can be obtained with water. The addition of glycerine to water accomplishes this purpose without filling the kitchen air with grease and smoke. Glycerine vaporizes only very slightly from the water."

Glycerine is an inexpensive, moderately sweet, syrupy liquid technically regarded as an alcohol, but having few of the characteristics commonly associated with alcohols. It is a by-product of soap manufacture and is used in printers ink, medicinal preparations, and is called for in some recipes as a partial replacement for sugar as a sweetening agent.

In double boiling of cereals and hard boiling of eggs, there is no occasion for the food to come in contact with glycerine, Mr. Kanegis said. In pressure cooking, the experiments showed that only the water vaporized to penetrate foods, and the glycerine remained a liquid, and did not sweeten the food. In direct immersion boiling, such as with dried prunes, glycerine added "a pleasant, sweet flavor," Mr. Kanegis said.

The new technique grew out of Brenda Kanegis's desire to reduce the time she devoted to cooking for her father and 11-year-old brother, Gary. After consulting scientists associated with glycerine manufacture and uses, she enlisted her father's help in

devising experiments to measure glycerine's effects on cooking.

From her studies, the Hyattsville, Md., Junior High School student devised a detailed science fair project which won second place in the chemistry section of the Prince Georges County, Md., Science Fair.

Mr. Kanegis said Dr. Gilmont, a family friend, saw the science fair project report "and told us he believed it to be significant original work that should be published." He studied the chemical thermodynamics of the technique and the three of them co-authored the paper delivered by Dr. Gilmont.

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ASTRONOMY

Sun and Planets Formed At Temperature of Space

► THE SUN, earth and other planets were formed at the temperature of deep space, some 3.5 degrees above absolute zero, which is 459.7 degrees below zero Fahrenheit.

This theory for the origin of the solar system was drawn by Dr. Bertram Donn of Wayne State University for himself and Nobel Prize winner Dr. Harold C. Urey of the University of Chicago.

Dr. Donn outlined the role "free radicals" played in the early days of the solar system at a Symposium on the Formation and Stabilization of Free Radicals held at U. S. National Bureau of Standards. Free radicals are highly reactive fragments of molecules existing only momentarily unless frozen at very low temperatures.

The theory of the low-temperature sun resulted from studies of comets and meteorites. Dr. Donn pictured the formation as starting with the accumulation of dust and gas, which gradually condensed. However, the fiery temperatures of today's sun did not occur until the pressures at the condensation's center were sufficiently great to permit nuclear reactions. Then the sun became luminous.

During the time of the cold sun, the free radicals formed by ultraviolet light or by particle radiation of molecules were preserved in their very reactive state. When the free radicals later combined, the heat released by the reaction was sufficient to melt the solid objects, separating the silicates and iron that billions of years later fell to earth as meteorites.

The theory of Drs. Urey and Donn also accounts for the flaring or sudden brightening of comets. They proposed the sharp increase in brightness sometimes observed in very faint comets results from the chemical combination of free radicals previously frozen in the comet.

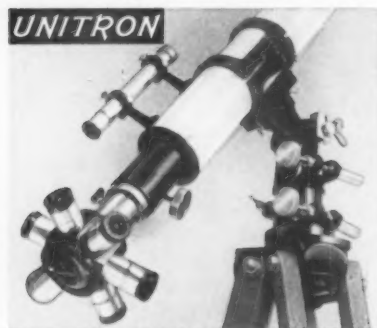
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PSYCHOLOGY

Big Disaster Problem

A traffic jam composed of people rushing into the disaster area is the major problem relief workers and police will face in coping with the affected community.

► IF DISASTER strikes suddenly at your city or community, the greatest problem will be posed by the tremendous numbers of people who throng to the scene, not the victims who want to get away.

How to handle the appalling traffic jam of those rushing into, not out of, the area will be the big headache of police and relief workers.

This is the conclusion of a special Committee on Disaster Studies of the National Academy of Sciences and the National Research Council. The committee made a careful study of a large number of tornadoes, floods, explosions and other calamities. (See p. 220.)

The finding contradicts a notion shared by many police and other control authorities that the major disaster problem will be the control of a panicky population. In actual fact, the investigators reveal, disaster victims are normally passive, cooperative and subject to control.

Even the horrible destruction and dangers of atomic attack cannot keep away the tremendous crowds of people who rush toward the scene of disaster.

Within 24 hours after the bombing of Hiroshima, the committee's report states, thousands of refugees came streaming back into the destroyed city.

"According to one of the USSBS (U. S. Strategic Bombing Survey) reports, road blocks had to be set up along all routes leading into the city because there were so many people who wanted to search for missing relatives or to inspect the damage."

Convergence of great numbers of people on the scene of a disaster is a virtually universal phenomenon, the report states. Those who return are people with, in general, five types of motives. There are the returnees who want to look for family or friends or to salvage what they can of their belongings. Then there are the anxious, the helpers, the simply curious and the exploiters.

Those who go to the scene of a disaster through curiosity, although often resented by the victims and relief workers, are generally not motivated simply by idle curiosity or by neurotic or "ghoulish glee" in witnessing destruction and suffering.

They seem to feel the need to understand the threat of such a catastrophe and its possible future danger to themselves. There is a need to direct and channel the activities of the curious rather than to block them off.

The danger of looting is mostly imaginary, the report indicates:

"In none of the peacetime disasters studied during recent years has there been a significantly large amount of looting or major theft."

The greatest need in handling disasters

is for speedy, accurate and specific information. It is principally the impossibility of learning the fate of loved ones in the disaster area that makes people rush to the spot or bombard it with telephone calls, telegrams or any other means of communication.

The report urges the organization in every community of a corps of information specialists who would have experience in news gathering and dissemination and who would be given special training in how to get the information out when all ordinary means of communication had broken down.

Ham radio operators, owners of loud speaker equipment and those who operate such communication facilities as radio stations, newspapers, telephone switchboards and printing establishments would be integrated into this corps and provided with couriers and clerks to help them.

Such information centers in localities not affected by the disaster could serve as clearing houses for collecting information and passing it on to relatives and friends.

Authors of the committee's report are Charles E. Fritz, research associate of the committee, and J. H. Mathewson of the University of California. Chairman of the committee is Dr. Carlyle F. Jacobsen of the State University of New York.

Science News Letter, October 5, 1957

● RADIO

Saturday, Oct. 12, 1957, 1:30-1:45 p.m., EDT. "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

James Kanegis, chief of the chemical section, Office of Technical Services, U. S. Department of Commerce, his daughter Brenda, 14, and son Gary, 11, will discuss "National Science Youth Month."

PHYSICS

Stellar Temperatures Reached in Laboratory

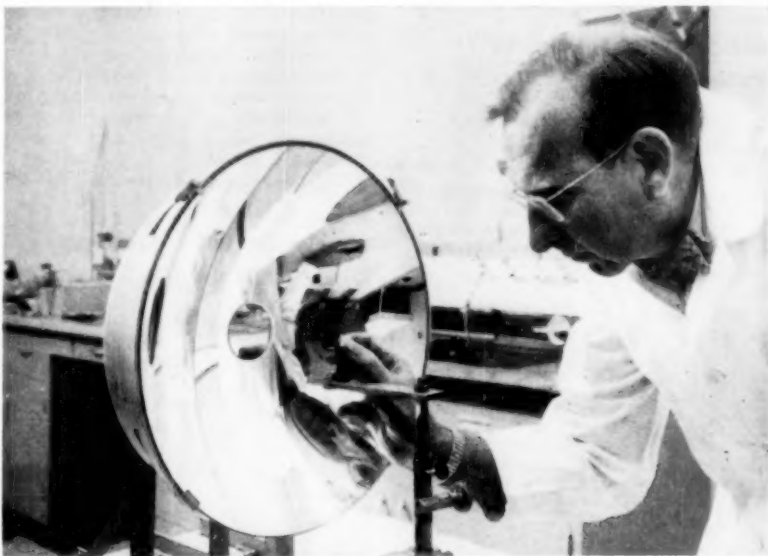
► TEMPERATURES many times as high as the sun's surface have been reached momentarily in the laboratory, a U. S. Naval Research Laboratory scientist reports in *Physical Review* (Aug. 15.)

A changing magnetic field is used to keep the deuterium gas away from the walls of the shock tube. Dr. Alan C. Kolb produces the shock wave by a very high voltage discharge between two electrodes at one end of the T-shaped tube.

Shock waves, because of the stellar-like temperatures they generate, have been suggested as a method of triggering hydrogen bombs without exploding an atomic bomb—a possible avenue to the so-called "clean" bomb.

Since heat is the energy of atoms in motion, the violently agitated gas particles behind the shock front reach incredibly high temperatures for an instant. Dr. Kolb warns, however, that no "direct" measurement of the deuterium's temperature has yet been made. Based on the Rankine-Hugoniot scale, he has found temperatures as high as 700,000 degrees Kelvin.

Science News Letter, October 5, 1957



HOT SPOT—An arc furnace developed by the National Carbon Company, Parma, Ohio, produces heat approaching that of the sun's surface. A sample is placed at the short focal point of a highly polished mirror, and heated to incandescence by concentrating the energy from a carbon arc in a standard motion picture projection lamp.

MEDICINE

Radio Wave Machine Promotes Faster Healing

► AN ELECTRONIC MEDICAL device called the Bio-Cold-Ray that can heal burns, ulcers and poison ivy faster than any other method is reported by Dr. Daniel L. Seckinger, former director of Public Health, District of Columbia, in the *Medical Annals of the District of Columbia* (Sept.).

The Bio-Cold-Ray generates radio waves at a frequency of 420 kilocycles per second, a little below the lowest frequencies used by commercial broadcasting stations.

The electrical energy is not the same as that from a short-wave diathermy machine, and seems to have some "unknown" attraction to tissues that results in faster healing. It does not heat the body internally as diathermy does, Dr. Seckinger reports.

One patient treated with the ray had been admitted to the hospital with advanced gangrene from frozen feet. Amputation was thought to be the only choice when the electronic treatments were started. Definite improvement was noticed after the fifth treatment. Within 30 days complete healing had occurred and the patient was released from the hospital as cured.

The Bio-Cold-Ray was also used on a severe case of poison ivy, and relieved the itching and soreness after the first treatment.

In use, the patient holds one electrode in his hand and places the affected part of his body between it and the machine. The Bio-Cold-Ray has been used on tissues as delicate as the eye without any noticeable increase in temperature, Dr. Seckinger reports.

Science News Letter, October 5, 1957

SURGERY

Mechanical Hearts Prove Life-Saving

► MECHANICAL HEART SURGERY, considered extremely daring only five years ago, is now more satisfactory for many heart conditions than older surgical methods, Dr. C. Walton Lillehei, University of Minnesota, Minneapolis, told many of the nation's heart specialists meeting at the National Institutes of Health, Bethesda, Md.

The meeting commemorated the discovery of circulation 300 years ago by England's famed William Harvey.

Dr. Lillehei, one of the world's foremost surgical users of heart-lung bypass machines, said that mortality was down to between one and two percent for repair of ventricular septal defects. These are cases in which there is a hole between the two pumping sections of the heart, allowing blood from the veins and arteries to mix inside the heart where it should not.

Use of the heart-lung machines gives the surgeon enough time, up to more than an hour, Dr. Lillehei said, to repair the defect while the breathing and blood pumping functions of the heart and lungs are taken over by the machine.

The heart patients are almost always children, because the condition usually kills an individual before he reaches adulthood.

Amazing as many of the new developments in heart surgery are, Dr. Lillehei said that if William Harvey were still alive he would probably wonder why there have not been further advances.

These have been slowed up by an unfavorable "intellectual atmosphere" that helps to discredit new ideas, Dr. Lillehei charged.

Science News Letter, October 5, 1957

ENGINEERING

Lightweight Gas Turbine Developed by the Army

► A LIGHTWEIGHT GAS turbine engine weighing only 326 pounds, one-tenth as much as diesel or gasoline engines of comparable performance, is now under development by the U. S. Army.

The little engine works much like a jet motor, with expanding gases burning at a red-hot 1,500 degrees Fahrenheit, turning a high-nickel alloy steel turbine impeller wheel that generates power at a constant speed, about 12,000 rpm. Approximately 44 inches long, 31 inches wide and 29 inches high, the gas turbine was developed by the Army's Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va., and AiResearch Manufacturing Company of Arizona.

The engine can run on ordinary combat gasoline, aviation, jet or diesel fuel, and will be capable of producing 170 horsepower under extreme conditions, or 286 hp normally in a sea-level environment. As a constant-speed, low-torque engine, it is not expected to be used as a truck or car motor, but primarily as an engine to generate electrical power in an engine-generator "power package" putting out approximately 100,000 watts of electrical power at 400 volts.

The engine is designed for 1,000 hours of life before overhauls, and maximum ease of maintenance in the field. Present designing and tests are expected to be completed by mid-1958.

Science News Letter, October 5, 1957

GENERAL SCIENCE

Show Interlingua on Slides for English Lecture

► A WAY to lecture in a language the audience does not speak and yet have them understand has been worked out in Lima, Peru, by an American pediatrician, Dr. Lytt I. Gardner of the State University of New York's department of pediatrics, Syracuse Memorial Hospital, Syracuse, N. Y., who attended international congresses on pediatrics.

Lantern slides with legends in Interlingua, the international language based on basic western European languages, were shown by Dr. Gardner. The Spanish-speaking audience was nevertheless able to read them and follow what Dr. Gardner said in a two-hour talk before the Medical School of San Marcos, Lima.

Science News Letter, October 5, 1957

IN SCIENCE

TECHNOLOGY

Israel's Sun Freshens, Heats Water, Dries Crops

► THE SUN'S HEAT is being used in three ways, to provide hot water, dry agricultural crops and desalt water in new developments by the Technion, Israel Institute of Technology, Haifa.

A new type of solar heater to provide warm water without use of scarce fuel is now in production and replaces an older type used hitherto, which was twice the size. The invention has been patented in the United States, Great Britain, Uruguay, Greece and other countries. It can heat 25 gallons of water to 155 degrees Fahrenheit in six hours.

A solar dryer for agricultural products, such as hay, has been turned over to Agriculture Ministry by Technion for comparison with other methods of drying.

To make sea and brackish waters drinkable by desalting them, construction of a solar still is being resumed after an interruption due to lack of funds.

Dr. N. Robinson is head of the solar physics laboratory.

Science News Letter, October 5, 1957

MEDICINE

Find Way for Earlier Mouth Cancer Detection

► EARLIER DIAGNOSIS of mouth cancer can be achieved by examination of cells shed from oral tissues, three University of California Medical Center scientists have found.

They adapted a cytological method—previously used as an aid in spotting cancer of the cervix, stomach and chest—to search for mouth cancer in 1,000 persons. One-half were normal, and one-half had mouth lesions of various kinds.

Results were especially striking in a group of 60 patients with mouth lesions, but in whom the likelihood of malignancy was so remote that biopsy was not proposed. Malignancy, however, was spotted in four of these.

In another series of 15 patients, all with suspected mouth cancers, each method missed one tumor when biopsy and cytology were compared, but in all 15 malignancies were confirmed.

The method is an aid, not a substitute for biopsy. It has the advantage of relative simplicity for screening patients in whom biopsy does not seem justified. Also, it is useful when biopsy may risk infection.

The work was done by Drs. Sol Silverman and Herman Becks, dental medicine, and Dr. Seymour Farber, physician, who report their findings in the *Journal of Dental Research*.

Science News Letter, October 5, 1957

THE FIELDS

BIOCHEMISTRY

Plant Protein Important To Photosynthesis

► FRESH EVIDENCE that Fraction I, a plant protein, is important to photosynthesis has been reported at the University of California at Los Angeles.

Dr. Robert Dörner, Albert Kahn and Dr. Samuel Wildman have been studying Fraction I, which is found only in plants and tissues containing the green pigment chlorophyll.

Properties of the protein correspond with those of a key enzyme in the photosynthetic process isolated by researchers at the National Institutes of Health.

The UCLA investigators found the same protein widely distributed in the plant kingdom. They also found that the amount of protein could be correlated with the leaf's capacity to photosynthesize.

The protein is abundant when the leaf is young and capable of maximum photosynthesis. As the leaf ages, the protein decreases as does the photosynthetic capacity. When the leaf becomes yellow and incapable of photosynthesis, the protein can no longer be detected.

The study also revealed the growing leaf is outstanding material for gathering much needed experimental information on protein synthesis, the researchers said. It also provides a model system for studying changes in the composition of living material during aging.

Science News Letter, October 5, 1957

GEOPHYSICS

Satellite Will Measure Cosmic Ray Increases

► MEASUREMENTS made from earth satellites should solve the mystery of where cosmic rays come from and where they get their energy, the highest known in nature.

Dr. S. F. Singer of the University of Maryland said that cosmic rays regularly arrive at the top of the earth's atmosphere with almost the speed of light. However, he told the American Physical Society meeting in Boulder, Colo., at times when the sun shoots out great tongues of flame thousands of miles into space, cosmic ray activity increases many times on these rare occasions.

It is fairly certain, Dr. Singer said, that the increased cosmic ray particles either are accelerated on the sun or were in the sun's vicinity at the time of the flare. They travel toward the earth and are then deflected by the earth's magnetic field, hitting only certain locations.

These so-called impact zones depend on the relative positions of the sun and earth at the time.

What is totally unknown is the reason

why only a few solar flares cause these large increases. Only five have been detected in the past 15 years, although thousands of flares have been recorded.

Observations from a satellite could establish whether increases occurred more often, but with effects not detectable from the surface. Since the satellite will survey most of the earth within a very short time, thus passing over all of the impact zones, measurements from it would give a picture of the geographic distribution of cosmic rays.

Following most solar flares by a little more than a day are disturbances in the earth's magnetic field. Associated with these magnetic storms are decreases in cosmic ray intensity, which last a day or so. These decreases occur even at the poles. They show a 27-day recurrence pattern, so are clearly associated with the sun's rotation period.

The "missing link" in solving this puzzle, Dr. Singer said, is a knowledge of the energy range of cosmic rays before they smash into the earth's atmosphere, knowledge which could be obtained from earth satellites.

Science News Letter, October 5, 1957

TECHNOLOGY

Offshore Oil Platform Works in Deep Water

► AN OFFSHORE OIL drilling platform that will operate in water six times deeper than that worked by present rigs was reported in Tulsa, Okla.

The floating platform, which can be economically converted from a mobile-type rig to a permanent one, was described at the petroleum section meeting of the American Society of Mechanical Engineers by R. L. LeTourneau, vice president of R. G. LeTourneau, Inc., Longview, Tex.

Mr. LeTourneau said the platform will be able to operate over water up to 600 feet deep. Most present offshore oil drilling is confined to water only about 100 feet deep, he said.

The new rig will carry its own diesel-electric power system to raise itself on its tripod legs, and the legs can be carried disassembled on the deck and attached after the machine arrives at the drilling location.

Science News Letter, October 5, 1957

TECHNOLOGY

Develop 250-Pound Jet Airplane Engine

► A SMALL JET ENGINE for airplanes that weighs only 250 pounds but delivers a thrust of 1,050 horsepower was described at the American Society of Mechanical Engineers meeting in Hartford, Conn.

The lightweight gas turbine engine is called the T58 by its developers, the General Electric Company. The T58's turbo-shaft engine is 16 inches in diameter and 55 inches long.

It is seen as a major step towards reducing the weight and increasing the efficiency of aircraft engines.

Science News Letter, October 5, 1957

METEOROLOGY

Falling Snow Can Trigger Lightning

► LIGHTNING BOLTS can be triggered by snow falling through electrically charged sections of clouds, two University of Chicago scientists have reported.

Dr. Horace R. Byers and Donald R. Fitzgerald said the snow in the cloud's upper part has a positive charge, while the moist lower cloud is negatively charged.

The negative field is boosted as the snow falls through it, resulting in lightning bolts sometimes hitting the positively charged earth, they told the joint meeting of the International Association of Meteorology and the International Union of Geodesy and Geophysics at the University of Toronto in Canada.

The cloud's millions of volts are built up by strong currents of rising air that pull negatively charged air molecules from the surrounding air. As the cloud pushes up through the atmosphere, it reaches freezing levels, where the water droplets turn to snow and take on a strong positive charge.

The snow falls when it becomes too heavy to be supported by the vertical air flow. Of the lightning bolts started by snow, only about a third ever reach the ground. Most go on to positively charged parts of other clouds.

After a bolt is fired, the cloud's negative electricity is rebuilt by the strong upward air currents.

Data for their report were obtained by Air Force B-17 bombers flying 1,000 passes through cumulus clouds.

Science News Letter, October 5, 1957

MEDICINE

Make New and Better TB Drug From Old One

► A BETTER TB drug, longer acting and less toxic than the presently used isoniazid, is reported by scientists from the University of Melbourne, Australia, in *The American Review of Tuberculosis and Pulmonary Diseases* (Sept.).

Named Verazide, the drug is derived from isoniazid by chemical treatment. It appears to be safe in man in doses up to four times those recommended for isoniazid. Drs. Sydney D. Rubbo, Janice Edgar and Geoffrey Vaughan of the University's school of bacteriology state.

Although isoniazid is probably the most effective drug now available against tuberculosis, it can cause neuritis in some TB patients. In neuritis, the nerve cells become damaged and cause pain sensations that vary from tingling to stabbing.

To prevent this, patients on isoniazid must often be given supplementary doses of vitamin B-6. Verazide is regarded as potentially superior to isoniazid since higher concentrations can be kept in the body without this side effect.

It appears to work against tuberculosis in the same way as isoniazid. Clinical trials have been started in Australia and South Korea.

Science News Letter, October 5, 1957

FOREST PATHOLOGY

Our Sick Trees

Research and the forest pathologist may provide ways to control and eventually eliminate tree diseases that cause an annual loss in wood equivalent to 2,000,000 five-room houses.

By BENITA TALL

► IMAGINE yourself standing on a wooden sidewalk, one inch thick and one-half mile wide, that extends across the United States from New York City to San Francisco. Stretch your imagination a little more and imagine that whole sidewalk collapsing—a long pile of rotten, decayed and diseased wood.

That will give you some idea of the amount of timber destroyed each year either directly or indirectly by tree diseases.

Diseases such as the chestnut blight, white pine blister rust, the Dutch elm disease, heart rots, and oak wilt take an annual toll of our trees that amounts to about 20 billion board feet.

These costly tree diseases come in many sizes and shapes, very much like diseases to which humans are subject.

Trees suffer from diseases associated with old age. The wrong environment such as overcrowding and malnutrition can result in a sick tree. Viruses and fungi cause some disease, while other diseases are tagged "cause unknown." One disease can kill completely and quickly. Another may kill slowly, all but undetected.

One difference, however, between tree and human disease is the number of scientists working on the problem of curing, treating and preventing disease. We have all kinds of specialists, research scientists, bacteriologists, public health officers, surgeons, nurses, internists and nutritionists to name a few. In contrast there are a handful of forest pathologists to do the research, treat diseased trees and control the spread of disease.

Much of this work is being done by the 65-odd forest pathologists, most of them PhD's, with the U. S. Forest Service's forest disease research division. The Government's forest disease research program, often in co-operation with the states and private groups, is directed at the problem of tree diseases.

War on Oak Wilt

What is being done to combat the oak wilt fungus is an excellent example of the disease research division's work.

Even though the current losses in oak timber amount to one-fifth of one percent of our oak supply annually, oak wilt poses a serious problem if left uncontrolled. Even with control measures undertaken by Federal, state and private forest workers, the wilt has been slowly but definitely spreading in the Appalachians and the Alleghenies.

It probably was active in Wisconsin and Iowa for 40 years or more before its identification as a fungus disease in 1942. It is now found scattered over a wide area in the Lake

and Central States, from Pennsylvania to North Carolina and westward through Tennessee and northern Arkansas to eastern Kansas and Nebraska.

Oak stands ranging in size from a few to 100 acres in Wisconsin and Iowa have been practically denuded of trees. Scientists believe the disease fungus is not able to survive temperatures higher than 90 degrees Fahrenheit, which may be a natural limiting factor in its spread. Southeastern areas that have reported cases of oak wilt are largely in the cooler mountains or foothills.

One of the ways scientists believe that oak wilt is spread is by insects entering wounds caused by blazing, tree climbing and by lightning. Fungus "mats" are formed under the bark of diseased trees; these mats raise and crack the bark emitting an odor that attracts many insects to the infected tree. Squirrels and possibly other animals, birds and especially beetles may be responsible for spreading disease-causing spores to healthy trees.

Since the spore-bearing fungus mats are essential to the wilt's spread, one control method is to "cut and burn" infected trees before mats are formed. An oak dying of wilt usually loses its leafy crown so that an aerial survey of an area where the disease is suspected will usually show up injured trees.

There is also much evidence that oak wilt is spread underground through root grafts

between a diseased tree and neighboring oaks of the same group; red and white oaks rarely graft with each other.

A root graft is a "merger" of the roots of different trees that sometimes occurs naturally because of pressure or continued contact. Recent experiments on oak trees on a 3,000-acre experimental forest near Bunker, Mo., may provide scientists with some needed basic information on the mechanism of fungus spread. Eight black oak trees were inoculated with a radioactive isotope. When radioactivity measurements show how the trees are connected or related to the other forest trees, the original eight trees will be inoculated with an albino strain of the oak wilt fungus. If this unique strain is then found in the same trees that became radioactive, the scientists will have evidence for fungus transmission through root grafts.

If oak wilt is currently the most highly publicized tree disease, it is certainly not the only important one.

Diseases with exotic names like Elytrodema needle cast—which has killed outright 50,000,000 board feet of high-quality pine within the past eight years—and with plain names like pole blight—61,000,000 board feet is the annual toll here—need to be studied. Dwarf-mistletoe, a relative of the popular Christmas-time plant, causes an annual loss to our western pines, firs, hemlocks and larches amounting to about 600,000,000 board feet or 60,000 five-room houses.

Basic Research Needed

How do you go about protecting trees from disease? It is a difficult and compli-



THE ONCE MIGHTY OAK—This felled white oak, a part of the George Washington National Forest in Virginia, shows the extent of internal decay and rot which has hollowed out the tree trunk. Tree diseases take an annual toll of our forests equal to 20 billion board feet of timber.

cated process, says Dr. J. R. Hansbrough, director of the forest disease research division. The biggest problem facing the forest pathologist is lack of basic information on what makes a tree "tick."

Scientists know a great deal about the heart and lungs, the muscle tissue, and digestive processes of animals. They know little about the physiology of trees. This is a big handicap for the forest pathologist. Many similar diseases affect both animals, including the human "animal," and trees.

"Heart trouble," or heart rots in trees, is a killer for both. Trees are subject to virus infections, fungus attacks and old age. Nutrition and environment influence growth and health for both. However, in contrast to the biologist studying animals, the forest pathologist's understanding of the factors that influence a tree's health have been limited to a narrow range of observations and experimentation.

No "Guinea Pig" Tree

There is no such thing as a "guinea pig" tree, one with a short enough life cycle to permit detailed study of the biological processes in a tree. Studying seedlings offers the scientist some basic information on tree physiology, but the results may not always be applicable to the full grown, mature tree. General studies on plant physiology, especially of simple one-celled plants, do not always apply to the tree.

Its very size and long life make the forest tree difficult to study.

Another problem is the way diseases attack only certain trees. Fusiform rust, the most important disease of loblolly and slash pines, does not cause as much damage on the rust-resistant longleaf pine. Red oaks generally die the year they become infected with oak wilt, while trees in the white oak group may not die for several years.

Even with adequate knowledge of tree physiology and pathology, economics would further complicate the study of forest disease research.

Every bit of the tree—from its crown to its roots—is useful economically. In addition to the well-known products such as pulp for paper, wood for furniture and charcoal, the forest is a treasure house of useful products. Crayons and explosives (from resins), soil conditioners and vanillin (from lignin), phonograph records and sausage cases (from cellulose), and musical instruments and barrel staves (from logs) are all forest products.

While much current research is necessarily directed at reducing the huge losses caused by existing disease, the ultimate goal of the forest pathologist is prevention. Research directed at preventing forest diseases holds the greatest promise for the future.

Breeding resistant trees—genetics—is one of the USDA's forest disease research division's most hopeful projects. The resistant tree of the future, like the human with an immunizing shot, is protected against disease and there is no longer need for controlling an epidemic, whether of oak wilt or the flu.

Science News Letter, October 5, 1957

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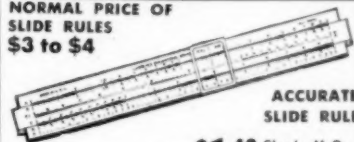
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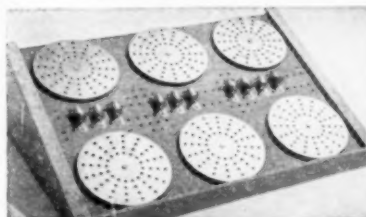
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For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANGULAR MOMENTUM IN QUANTUM MECHANICS—A. R. Edmonds—*Princeton University Press*, 146 p., diagrams, \$3.75. A practical manual for the physicist.

ATOMIC ENERGY AND AGRICULTURE—C. L. Comar, Ed.—*American Association for the Advancement of Science*, Publication No. 49, 450 p., illus., \$9.50. Papers presented at a symposium at the Atlanta meeting of the AAAS in 1955.

A BIBLIOGRAPHY FOR THE INTERNATIONAL GEO-PHYSICAL YEAR—Lee Anna Embrey and others—*Gott. Printing Office*, National Science Foundation, 51 p., paper, 25 cents. The articles listed are mostly of a non-technical nature. Panel, committee and staff members of the IGY are listed.

BY WHICH WE LIVE—Ernest Swift—*National Wildlife Federation*, 38 p., paper, single copies free upon request direct to publisher, 232 Carroll St., N. W., Washington 12, D. C. A collection of essays on conservation written by the executive director of the Federation.

CHILD PSYCHIATRY—Leo Kanner, prefaces by John C. Whitehorn, Adolf Meyer and Edwards A. Park—*Charles C. Thomas*, 3d ed., 777 p., illus., \$8.50. A new edition of a well-known text.

A CLASSIFIED BIBLIOGRAPHY OF GERONTOLOGY AND GERIATRICS: Supplement One, 1949-1955—Nathan W. Shock—*Stanford University Press*, 525 p., \$15.00. Interest in this field has so increased that almost as many articles have been published in the period covered by this supplement as were published in the entire period of almost half a century covered by the original bibliography.

CONSTRUCTING AN ASTRONOMICAL TELESCOPE—G. Mathewson—*Philosophical Library*, 2d ed., 100 p., illus., \$3.00. To help the amateur astronomer possess an instrument without a large capital outlay.

CONVERGENCE BEHAVIOR IN DISASTERS: A Problem in Social Control—Charles E. Fritz and J. H. Mathewson—*National Academy of Sciences-National Research Council*, Committee on Disaster Studies, Disaster Study Number 9, 102 p., illus., paper, \$2.00. (See p. 215.)

THE DETECTION AND MEASUREMENT OF INFRARED RADIATION—R. A. Smith, F. E. Jones and R. P. Chasmar—*Oxford University Press*, 458 p., illus., \$11.20. Presenting an account of modern practice in infra-red techniques for advanced students and research workers.

A DICTIONARY OF SCIENTIFIC TERMS: Pronunciation, Derivation, and Definition of Terms in Biology, Botany, Zoology, Anatomy, Cytology, Genetics, Embryology, Physiology—I. F. Henderson and W. D. Henderson—*Van Nostrand*, 6th ed. by J. H. Kenneth, 532 p., \$12.50. Defining some 14,000 terms from abaxial to zygote.

FABULOUS FIREBALL: The Story of Solar Energy—D. S. Halacy, Jr.—*Macmillan*, 154 p., illus., \$3.00. Solar radiation is the world's only inexhaustible source of energy, but before we reach the point where we can make use of this resource, many discoveries must be made. This book is intended to inspire those now children to turn to this study.

FADS AND FALLACIES IN THE NAME OF SCIENCE—Martin Gardner—*Dover*, 2d rev. ed., 363 p., paper, \$1.50. This book, formerly published under the title "In the Name of Science," de-

scribes hoaxes, fads and theories not generally accepted by scientists, such as flying saucers, Lysenkoism, Atlantis, Orgonomy, Dianetics, ESP and Bridey Murphy.

FIRST AID TEXTBOOK—American National Red Cross—*Doubleday*, 4th ed., 241 p., illus., paper, 75 cents, cloth \$1.00. A new edition of this famous book for first-aid classes. Tells what should be done in a variety of emergencies from drowning to tarantula bite. (See p. 212.)

FOR FUTURE DOCTORS—Alan Gregg—*University of Chicago Press*, 165 p., \$3.50. A Collection of lectures by the late vice-president of the Rockefeller Foundation, introducing medical students to their future profession.

THE GOLDEN PICTURE BOOK OF SCIENCE: Animals, Plants, Rocks, Gravity, Day and Night, Rain and Snow, the Sky and Ocean With 45 Experiments and Activities—Rose Wyler—*Simon and Schuster*, A Fun-to-Learn Golden Book, 57 p., illus., with drawings by Marjorie Hartwell and Valerie Swenson, \$1.35. The simple science experiments will delight the grade-school child.

HANDBOOK OF HOLLIES—Harry William Dengler, Guest Editor—*American Horticultural Society*, National Horticultural Magazine special issue, 193 p., illus., paper, \$3.00. Between 20 and 30 species of holly are native to North America. This handbook tells how to propagate and grow holly, and how to use it in landscaping and flower arrangements, especially for the Christmas season.

HISTORY OF THE PRIMATES: An Introduction to the Study of Fossil Man—W. E. LeGros Clark—*University of Chicago Press*, 186 p., illus., paper, \$1.25. An eminent British anthropologist traces the story of how man began.

THE ILLUSTRATED BOOK OF THE SEA—Leon A. Hausman and Felix Sutton—*Grosset & Dunlap*, 101 p., illus., with drawings in color by Art Renshaw and Herman Bischoff, \$3.95. A beautiful book for children.

AN INEXPENSIVE SCIENCE LIBRARY: A Selected List of Paperback Science Books—Hilary I. Deason—*American Association for the Advancement of Science*, 16 p., paper, 10 cents. The books listed range in price from 35 cents to \$2.75; the majority sell for less than a dollar.

AN INTRODUCTION TO FLUID MECHANICS AND HEAT TRANSFER: With Applications in Chemical & Mechanical Process Engineering—J. M. Kay—*Cambridge University Press*, 309 p., diagrams, \$7.00. Primarily a text for chemical and mechanical engineers in the process industries and at the university, but useful to all concerned with the applications of fluid mechanics and heat transfer.

LIVING REPTILES OF THE WORLD—Karl P. Schmidt and Robert F. Inger—*Hanover House*, 287 p., illus., \$10.00. Profusely illustrated with photographs, many in full color, this book covers not only snakes but lizards, iguanas, chameleons, geckos and other reptiles.

MATHEMATICS FOR SCIENCE & ENGINEERING—Philip L. Alger—*McGraw-Hill*, 360 p., illus., text ed., \$5.50. To supplement the ordinary elementary mathematics course. Based on "Engineering Mathematics" by Charles Proteus Steinmetz.

MENTAL HEALTH IN COLLEGE AND UNIVERSITY—Dana L. Farnsworth—*Harvard University Press*, 244 p., \$5.00. One problem of mental health, the author says, is that of helping the

individual to free himself from disabling internal conflicts as well as to avoid external discord.

THE NATURE OF RADIOACTIVE FALLOUT AND ITS EFFECTS ON MAN—Carl T. Durham, Chairman, Joint Committee on Atomic Energy and Chet Holifield, Chairman, Special Subcommittee on Radiation—*Govt. Printing Office*, 2065 p., illus., paper, Part 1, \$3.75; Part 2, \$2.75. Reporting the public hearings on a serious topic.

OUR SUN AND THE WORLDS AROUND IT: Planets, Moons, Comets and Other Wonders of the Solar System—Jene Lyon—*Simon and Schuster*, A Fun-to-Learn Golden Book, 57 p., illus., with drawings by George Solonewitch, \$1.35. Introducing youngsters to the fascinating world above our heads.

THE PORPHYRY COPPERS IN 1956—A. B. Parsons—*American Institute of Mining, Metallurgical, and Petroleum Engineers*, 270 p., illus., \$5.00. Supplementing the author's "The Porphyry Coppers," a history of the principal copper mining companies in the Americas.

PSYCHOPATHIC PERSONALITIES—Harold Palmer—*Philosophical Library*, 179 p., \$4.75. Telling how to recognize and deal with the hysterics, paranoiacs and psychopaths who disrupt and bring nations to the brink of war. By a British psychiatrist.

ROCKEFELLER FOUNDATION THE PRESIDENT'S REVIEW FROM THE ANNUAL REPORT 1956—Dean Rusk, President—*Rockefeller Foundation*, 85 p., illus., paper, free upon request direct to publisher, 49 West 49th Street, New York, N. Y. During 1956 the Rockefeller Foundation appropriated more than \$30,000,000, the largest total in any single year since its establishment in 1913.

SCIENCE AND THE SOCIAL STUDIES—Howard H. Cummings, Ed.—*National Council for the Social Studies*, Twenty-Seventh Yearbook, 271 p., illus., paper \$4.00, cloth \$5.00. Urging that the study of science be included in courses on history, government and social science.

SCIENCE IN AUSTRALIAN PRIMARY SCHOOLS—C. D. Hardie, Ed.—*Melbourne University Press (Cambridge University Press)*, 90 p., illus., \$3.75. Suggesting what should be covered in a science course for very young children, and what is needed in the way of materials and equipment.

THE SEMINOLES—Edwin C. Reynolds—*University of Oklahoma Press*, 304 p., illus., \$5.75. An account of a people who hold a unique place among American Indians.

THE SLOW LEARNER: Some Educational Principles and Policies—M. F. Cleugh—*Philosophical Library*, 186 p., diagrams, \$3.75. An attempt is made nowadays in England to separate the low-grade uneducable children from the slow learners and also from those whose failure in regular classes is due to emotional difficulty.

THE WONDERWORLD OF SCIENCE—Warren Knox, Morris Meister, George Stone and others—*Scribner's*, rev. ed., Book One, 116 p., \$2.00, Book Two, 152 p., \$2.24, Book Three, 184 p., \$2.32, Book Four, 219 p., \$2.44, Book Five, 251 p., \$2.56, Book Six, 279 p., \$2.60. Beautifully illustrated texts for the elementary schools.

Science News Letter, October 5, 1957

A new material which scratches diamond and remains hard at temperatures where a diamond burns up is cubic boron nitride, known as "borazon."

The basic research upon which hydrographic charts are prepared normally consists of hand soundings, fathometer soundings and wire dragging to locate submerged pinnacles or rocks.

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The Annual National Science Fair (started in 1950) is held each spring in a different city. The NSF has been to Philadelphia, St. Louis, Washington, D. C., Oak Ridge, Tenn., Lafayette, Ind., Cleveland, Ohio, Oklahoma City, Okla., and Los Angeles, Calif. The boys and girls who show the best science exhibits in cooperating local science fairs get three-day all-expenses-paid trips to the National Science Fair, and a chance to compete there for honors and awards. Only sophomores, juniors and seniors in high school are eligible to go to the NSF but in most local science fairs boys and girls of all ages can compete for local honors. The host city for the NSF in 1958 is Flint, Mich. In 1959 it is scheduled for Hartford, Conn.

The Annual National Science Talent Search (started in 1942) is held each year for seniors in high school who want to compete for \$34,250 in Westinghouse Science Scholarships and Awards for their college education. Annually 300 are honored. Of these, 40 boys and girls, chosen as winners, also receive a five-day all-expenses-paid trip to Washington, D. C., to attend the Science Talent Institute; the 17th will be held in 1958. Experience in science clubs and participation in science fairs is great practice for those who are planning to compete in the STS when they are old enough.

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TRANSLATIONS

FRENCH, GERMAN, ITALIAN, PORTUGUESE, Spanish to English; English to Spanish. 1000 words \$20. (Long practice and Government experience). Vega-Gomez, 3818 Chestnut Street, Philadelphia 4, Pennsylvania.

TECHNOLOGY

Test "Bubble Bath" To Dampen Mine Fires

► DISASTROUS COAL MINE fires may be cooled in the future by a moving wall of foam made from substances similar to household detergents and bubble bath powders.

The U. S. Bureau of Mines plans a test in the near future of the British-developed technique of blowing a solid wall of wet bubbles through mine tunnels toward raging underground fires that hamper explosion rescue work. The wall of wet foam cools the fire and allows firefighters to move in close enough to extinguish the flames.

Plans for extensive tests were revealed at Madisonville, Ky., by Dr. Irving Hartmann, Pittsburgh, Pa., chief of the bureau's Branch of Dust Explosions, in a speech before the Western Kentucky Mining Institute.

A Bureau of Mines spokesman said the technique "looks promising" for cooling fires in mines with horizontal tunnels, but probably would not be useful in vertical shaft mines. In practice, a detergent foam is sprayed against a cotton net stretched across the tunnel. The resulting wall of foam is then blown through the tunnel by the mine's ventilating system.

Science News Letter, October 5, 1957

ENTOMOLOGY

Different Insect Stings Need Different Treatment

► HONEYBEE and wasp stings may feel alike, but they are actually different and should be treated differently, report U. S. Department of Agriculture entomologists.

The female honeybee, in contrast to the female of the wasp family, leaves the stinger in her victim. It is important to scrape out—never pull out—the stinger immediately to keep as much as possible of the venomous fluid from entering the flesh. If the stinger is pulled out, the fingers press the poison sacs attached to the stinger's base and this forces the poison into the skin, just as a hypodermic needle would.

Wasps, hornets and yellow jackets, all of the same family, use their stingers as weapons to force their poison into the victim's flesh and can sting repeatedly.

Cold applications to relieve the swelling that results from a bee or wasp sting followed by applications of a water and bicarbonate of soda paste is the recommended treatment when stung.

If stung many times, or if the reaction is severe, warns the U. S. Public Health Service, see a doctor promptly.

Science News Letter, October 5, 1957

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Questions

ASTRONOMY—How cold was it, according to one theory, when the sun, earth and other planets were formed? p. 214.

□ □ □

BIOCHEMISTRY—Where is Fraction I, a plant protein, found? p. 217.

□ □ □

PALEONTOLOGY—What reason is given as a possible explanation for giant ape's failure to survive? p. 213.

□ □ □

PHYSICS—What gas was involved in experiments designed to create temperatures many times as high as the sun's surface? p. 215.

□ □ □

Photographs: Cover, British Information Services; p. 211, U. S. Coast Guard; p. 213, U. S. Navy; p. 215, National Carbon Company; p. 218, U. S. Forest Service; p. 224, Racine Specialty Mfg. Co., Inc.

MEDICINE

Cough Remedy More Effective Than Codeine

► A COUGH medicine, two and a half times as good as the old standby, codeine, is reported by scientists at the Point Edward Hospital, Sydney, Nova Scotia.

Called Tesselon, the cough remedy is non-narcotic and creates no bad side effects.

It was tested on persons made to cough purposely by inhaling a mist made from a citric acid solution. One group was given codeine medication an hour before the test while another one was given Tesselon.

The new drug stopped 80% of the coughing while codeine stopped only 50% of it.

Codeine has been the standard anti-coughing medicine for many years, and until now no substitute has been found that equals it, dose for dose, in either effectiveness or simplicity.

Other cough suppressants have appeared on the market from time to time, but finally disappeared.

The Tesselon used in the trials was supplied by the Ciba Company of Canada.

Authors of the report, which appears in the *Canadian Medical Association Journal* (Sept. 15), were Dr. S. J. Shane, now at Dalhousie University, Halifax, N. S., T. K. Krzyski of the hospital, and Dr. S. E. Copp, now at Newington, Conn.

Science News Letter, October 5, 1957

Do You Know?

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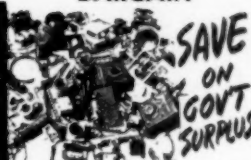
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For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 903. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **SELF-FEEDING PENCIL** automatically feeds lead at the correct writing length to prevent breaking of lead. No hand adjustment during writing is necessary, and the pencil is described as ideal for making carbon copies. The pencils are made with black, gray, red, blue and green barrels with erasers to match.

Science News Letter, October 5, 1957

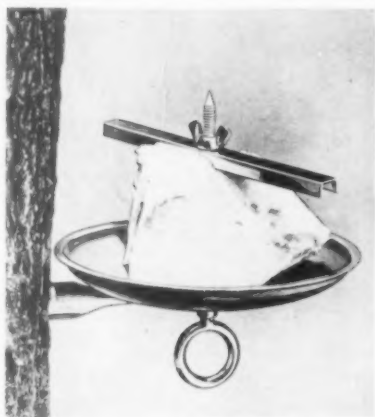
❁ **ILLUMINATED GLOBE** measures 18 inches in diameter and is equipped with a dial to show the time in all parts of the world. The globe is plastic and can be marked with a grease crayon and wiped clean. The lighted globe can be inflated by mouth and deflated for moving or storage.

Science News Letter, October 5, 1957

❁ **HEEL GUARD** protects the lady driver's shoe and hose heels from being scuffed or soiled. Made of a vinyl-coated fabric, the guards can be slipped and tied onto the foot so that the four and one-half inch back rubs against the car's floor rather than the heel of the wearer's shoe. Washable, the guards can be folded and purse-carried.

Science News Letter, October 5, 1957

❁ **SUET FEEDER** for bird lovers' use this fall and winter holds a large piece of suet, is easy to load, to clean and for birds to get



at. The feeder, shown in the photograph, is designed to be installed permanently and has an adjustable means for holding the suet down. Made entirely of aluminum, the tray is finished in green enamel.

Science News Letter, October 5, 1957

❁ **PHONOGRAPH ARM** for Hi-Fi enthusiasts is said to rest on a record as lightly as a sheet of tissue paper. The tone arm

places only one gram of pressure on a record. Equipped with a 0.7-mil diamond stylus, the arm is designed for use with a standard turntable, but not with a record changer.

Science News Letter, October 5, 1957

❁ **THREE-WAY COOKER** is described as doing the work of three pans. Divided into three compartments, the heavy-aluminum cooker has a large compartment that holds one quart and two smaller compartments that hold one pint each.

Science News Letter, October 5, 1957

❁ **DRAFTING APPLIQUE** made of translucent plastic still adheres to drawing paper after long periods of storage. The material will take pencil, pen or printing and can be used without the application of heat. In unprinted form, the material can be printed by standard offset equipment.

Science News Letter, October 5, 1957

❁ **TRACTOR SEAT** has a torsion rubber spring suspension system for taking the vibration and shock away from the driver. The smooth-riding seat is said to eliminate the need for farmers to stand while operating their tractors. It can be bought to replace tractor seats now in use.

Science News Letter, October 5, 1957



Nature Ramblings



By HORACE LOFTIN

➤ **THE CHANGE** from summer to fall calls forth a double migration—the birds migrate south and the bird watchers migrate to woods and marshes to watch their autumnal flight.

Bird students situated near the Gulf of Mexico are in an especially good place to observe the great waves of birds on their way to South American winter quarters.

It takes a "bad" day, with hard southern winds, drizzling rain and ominous sky for the best autumn bird watching on the Gulf coast. This kind of weather brings the south-bound birds to a halt in the pine and scrub oak trees that border the beaches. Otherwise, the fascinating variety of warblers and other migrants are likely to pass the land and move on over the Gulf in the dead of night.

In September, even before the height of fall migration, a small party of bird watchers took advantage of awful weather to see some 50 species of birds, including 15 different migratory warblers, holed up in

The Autumn Wave



the woods of an off-shore island on the Florida Gulf coast.

At first, early in the afternoon, it was difficult to find any birds—just a few locals like the Carolina wren, towhee and Eastern kingbird.

However, about 2:30 the first flock was located flitting from pine to pine in the middle of the island. The majority of the birds were pine warblers, but unusual species for the area, like the golden-wing warbler and bachman's warbler, soon put in their appearance.

That first flock moved along faster than

the bird watchers could follow. Soon, however, another group was located. For some fifteen minutes, warblers and vireos were so plentiful that the naturalists could hardly focus their binoculars on one before another more interesting bird diverted their attention.

Not only warblers and vireos, but relatively rare birds such as the black-billed cuckoo, were added to the bird list that blustery September afternoon.

This day in the field was but a preliminary run of the great migration to follow as the shortening days and falling temperatures of autumn drive the migratory birds from their northern summer homes.

In October, the big event of autumn bird watching comes—the fall bird count, when bird lovers from all over the country turn out to witness and record the peak of the migratory flight.

In the north, this will mean fewer birds seen in the field. In the south, the total will swell—until the migratory urge carries numberless birds onward to their winter homes in the tropics.

Science News Letter, October 5, 1957